BIOCHEMISTRY, PH.D.

The Integrated Program in Biochemistry (IPiB) is a joint graduate program between the Department of Biochemistry and the Department of Biomolecular Chemistry, providing students with the opportunity to work with 50 faculty members. The program offers a Ph.D. degree with a major in biochemistry. Although an M.S. degree is officially offered, students are not admitted for a terminal master’s degree.

The program has excellent research facilities and active research programs in the major areas of contemporary biochemistry, including: cell and developmental biology, chemical biology, computational biology, endocrinology, enzymology, immunology, metabolism, molecular genetics, molecular medicine, physical biochemistry and biophysics, structural biology, systems and synthetic biology, and virology. These are set in the highly interactive research environment that pervades the UW–Madison campus. Close association is maintained with other departments and programs having a biochemical orientation including animal sciences, bacteriology, biophysics, botany, cell and molecular biology, chemistry, genetics, nutritional sciences, oncology, plant pathology, and zoology. An exceptional range of research projects and advanced seminars is available to graduate students.

The program prepares students for teaching and research in academic positions, for research in government service, and for research and development work in industry.

DUAL DEGREES

The program participates with the School of Medicine and Public Health in offering a joint program for students wishing to complete both the M.D. and Ph.D. degrees. The basic prerequisites and degree requirements for the Ph.D. in the M.D./Ph.D. program are identical to those for the major in biochemistry; however, the minor may be taken in medical sciences. For the prerequisites and degree requirements for the M.D. degree, as well as the online application form, see Medical Scientist Training Program (http://mstp.med.wisc.edu).

FUNDING

IPiB offers stipends in the form of traineeships, research assistantships, or fellowships to all Ph.D. candidates, and assists those with outstanding records in competing for University and national awards. The program guarantees a full stipend ($27,000 for 2017–18) for all its Ph.D. candidates who remain in good standing in the program. In addition to the stipend, all students receive tuition remission and comprehensive health insurance.

REQUIREMENTS

MINIMUM DEGREE REQUIREMENTS AND SATISFACTORY PROGRESS

To make progress toward a graduate degree, students must meet the Graduate School Minimum Degree Requirements and Satisfactory Progress (http://guide.wisc.edu/graduate/#policiesandrequirementstext) in addition to the requirements of the program.

DOCTORAL DEGREES

Ph.D.

MINIMUM GRADUATE DEGREE CREDIT REQUIREMENT

54 credits

MINIMUM GRADUATE RESIDENCE CREDIT REQUIREMENT

42 credits

MINIMUM GRADUATE COURSEWORK (50%) REQUIREMENT

All coursework must be in graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university's Course Guide (http://my.wisc.edu/CourseGuideRedirect/BrowseByTitle).

PRIOR COURSEWORK REQUIREMENTS: GRADUATE WORK FROM OTHER INSTITUTIONS

For well-prepared advanced students, the program may accept up to 6 credits prior graduate coursework from other institutions towards the minimum graduate degree credit and minimum graduate coursework (50%) requirement. The minimum graduate residence credit requirement can be satisfied only with courses taken as a graduate student at UW–Madison.

PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNDERGRADUATE

No credits from a UW–Madison undergraduate degree are allowed to count toward the graduate degree.

PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNIVERSITY SPECIAL

No credits taken as a University Special student are allowed to count toward the graduate degree.

CREDITS PER TERM ALLOWED

Non-dissertator status: 12 credits. Dissertator status: 3 credits.

PROGRAM-SPECIFIC COURSES REQUIRED

Contact the program for information on any additional required courses.

DOCTORAL MINOR/BREADTH REQUIREMENTS

Doctoral students must complete a doctoral minor.

OVERALL GRADUATE GPA REQUIREMENT

3.00

OTHER GRADE REQUIREMENTS

The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.

PROBATION POLICY

The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result
in academic probation with a hold on future enrollment or in being suspended from the Graduate School.

**ADVISOR**

Every graduate student must have an IPiB faculty thesis advisor. The thesis advisor advises the student about coursework, supervises the student's research, and acts as a mentor to the student through the student's graduate career. The thesis advisor must approve the student's coursework before registration for a given semester and must also approve any subsequent changes to it.

A Ph.D. thesis committee is composed of at least five graduate University faculty members, including the thesis advisor. The thesis committee is empowered by the Program to advise the student about certification, administer the preliminary examination, oversee yearly Progress reports, approve thesis composition, and conduct the final Ph.D. examination.

**ASSESSMENT AND EXAMINATIONS**

Doctoral students are required to take a comprehensive preliminary/oral examination after they have cleared their record of all Incomplete and Progress grades (other than research and thesis). Deposit of the doctoral dissertation in the Graduate School is required.

**TIME CONSTRAINTS**

Doctoral degree students who have been absent for ten or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

A candidate for a doctoral degree who fails to take the final oral examination and deposit the dissertation within five years after passing the preliminary examination may be required to take another preliminary examination and to be admitted to candidacy a second time.

**LANGUAGE REQUIREMENTS**

Contact the program for information on any language requirements.

**ADMISSIONS**

To qualify for admission to IPiB, an applicant must complete a bachelor's degree at a recognized, accredited college or university. The basic background for graduate study in biochemistry ordinarily would be provided by an undergraduate degree in biochemistry, chemistry, physics, or in one of the biological or medical sciences. Coursework in biochemistry, organic chemistry, physics, and physical chemistry is required. (Admission might be granted without one or more of these course requirements, but the deficiency must be made up within the student's first two years of graduate study.) The applicant's undergraduate grade point average must be at least 3.0 (4.0 scale). Graduate Record Exam (GRE) scores are required of all applicants. Advanced (Subject) GRE scores are strongly recommended.

**LEARNING OUTCOMES**

**KNOWLEDGE AND SKILLS**

- Gain a broad understanding of the biochemical principles that underlie all biological processes.
- Become aware of the current limitations of the state of understanding of this discipline and the strategies that are required to advance the field.
- Formulate and design new approaches that extend and apply biochemical principles beyond their current boundaries.
- Conduct independent research using a diverse breadth of biochemical processes.
- Think critically to address research challenges using a broad range of the theories, research methods, and approaches to scientific inquiry.
- Collaborate with investigators within the program, university, and beyond since current and future advances in the biomolecular sciences demand interdisciplinary skills.

**PROFESSIONAL CONDUCT**

- Foster professional and ethical conduct in the sciences, including but not limited to: exposition of the scientific method; ethical design of experimental protocols; reproducibility in science; professional behavior in industrial, government, and academic settings; documentation of scientific results; communication to other scientists and the public; peer review; and confidentiality.

**ADDITIONAL LEARNING GOALS**

- Develop communications skills that enable the articulation of research to fellow scientists and non-scientists.
- Explore career development opportunities in industry, government and academia to realize professional goals and paths.
- Develop teaching and mentoring skills in both lecture and laboratory settings.

**PEOPLE**

**Faculty:** Professors B. Fox (chair, Department of Biochemistry), Kiley (chair, Department of Biomolecular Chemistry), Amasino, Ansari, Attie, Bednarek, Brow, Butcher, Clagett-Dame, Coon, Cox, Craig, Denu, C. Fox, Friesen, Hayes, Holden, Hull, Keck, Kimble, Landick, Markley, Martin, Mitchell, Mosher, Ntambi, Palmenberg, Pike, Ralph, Raymond, Record, Sheets, Sussman, Wickens; Associate Professors Audhya, Chanda, Craciun, Henzler-Wildman, Pagliarini, Senes, Weibel; Assistant Professors Engin, Harrison, Hoskins, Lewis, Merrins, Raman, Romero, Venturelli, Wildonger